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**REMARKS**

Preliminarily, Applicant notes that the rejection has been made final as "necessitated by (Applicant's) amendment." Applicant respectfully submits that final rejection was premature. The Examiner's final rejection was expressed a twelve-page action, which presented numerous arguments for the first time and included several grounds of rejection based on newly cited art. Applicant submits that final rejections are intended to cut off further prosecution only after the issues between the Examiner and Applicant have been well defined. The issues between the Examiner and Applicant cannot yet be well defined if the Examiner presents numerous new arguments and new grounds of rejection. Applicant respectfully suggests that the mantra of "necessitated by Applicant's amendment" is too often invoked, as here, without little by way of explanation. Moreover, the undersigned attorney has yet to see an Office action that was not necessitated by Applicant's amendment.

The Examiner has considerable discretion under MPEP §706.07 when to make a rejection final. See for example, the paragraph in this MPEP sub-section that reads:

While the rules no longer give to an applicant the right to "amend as often as the examiner presents new references or reasons for rejection," present practice does not sanction hasty and ill-considered final rejections. The applicant who is seeking to define his or her invention in claims that will give him or her the patent protection to which he or she is justly entitled should receive the cooperation of the examiner to that end, and not be prematurely cut off in the prosecution of his or her application. But the applicant who dallies in the prosecution of his or her application, resorting to technical or other obvious subterfuges in order to keep the application pending before the primary examiner, can no longer find a refuge in the rules to ward off a final rejection.

Accordingly, Applicant respectfully requests that the finality of the rejections be reconsidered and withdrawn.

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In the aforementioned Office action, claims 1-5 and 7-22 were rejected as unpatentable under 35 U.S.C. §103(a) over various combinations of previously and newly cited prior art. The rejection has been made final. By this amendment, the claims have been further amended to define the invention more clearly over the cited art, as further discussed below. The amendment is believed to place the application in condition for allowance. Entry of the amendment under 37 CFR §116 is respectfully requested, if Applicant's request for withdrawal of the finality of the rejection is denied.

Applicant notes with appreciation the Examiner's withdrawal of the objection to the drawings and the objection to the specification.

In discussing Applicant's previously presented arguments, in section 4 of the action, the Examiner first asserts that Applicant had argued that Dent does not disclose "the uplink data destined for at least one of a first and a second downlink beam hop location." By way of clarification, Applicant notes that the quoted feature of original claim 1 was deleted from the claims in Applicant's amendment of February 11, 2004. The Examiner continues, in section 4 of the action, to mention three issues with respect to Applicant's prior arguments. These issues are addressed in the following three paragraphs.

First, the Examiner states that "not clearly stated in the claims is switching a packet/cell to multiple downlink beams in the same beam layout pattern or fan." This statement raises two sub-issues: (a) There is no recitation, nor was there intended to be, of the function of switching a single packet or cell to multiple downlink beams. There is a clear recitation of the function of switching waveforms derived from uplink data packets to multiple downlink beams. (b) Contrary to one part of the Examiner's

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statement, there is also a recitation (e.g., in claim 1) of a multiple beam downlink antenna comprising a plurality of radiating elements, each of which is responsible for generating an independently controllable downlink beam to "terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region." The words "or fan" in the Examiner's statement have no place in Applicant's claims because, unlike Dent's apparatus, the present invention does not employ a phased array antenna with which the "fan" concept is associated. (c) The Examiner further asserts in discussing the first "issue" that "Dent meets the above-cited limitation by switching packets to multiple beams in different fans simultaneously (e.g., see column 3, lines 6-10)." Dent teaches transmission over multiple beams (in different fans) simultaneously, but as further discussed below, Applicant submits that this is not a teaching or suggestion of the present invention.

The second issue the Examiner raised in relation to Applicant's remarks was that it was "unclear what applicant is arguing since applicant did not point out specific support in applicant's specification." It is hoped that this amendment and the accompanying remarks below will clarify Applicant's argument. The Examiner goes on to assert that "not clearly recited is that the terrestrial cells are located in the same terrestrial region." Claim 1, even prior to the present amendment, recited "a multiple beam downlink antenna comprising a plurality of radiating elements, each of which is responsible for generating an independently controllable downlink beam to one of an equal plurality of terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region." Claim 17 lacks this specific language but has now been amended similarly to claim 1.

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The third issue raised by the Examiner concerning Applicant's prior arguments was the relevance of Peyrovian, which was cited for its teaching of "multicasting." Peyrovian is concerned only with a satellite uplink receiver, and discloses a scalable switch matrix and demodulator bank architecture for a satellite uplink receiver. The switches 42 mentioned in the cited paragraph [0029] receive multiple uplink beams and can multicast them to multiple demodulators in the uplink receiver architecture. Applicant is unclear how this pertains to multiple downlink beams, which are not discussed in the reference.

Turning to the specific rejections, Applicant notes that claims 1-5 and 17-21 have been rejected, in section 6 of the action, under 35 U.S.C. §103(a) as allegedly unpatentable over Dent in view of Peyrovian. In comments accompanying the rejection, the Examiner asserts that item (1) of claim 1 (the self-addressed packet switch) is taught as part of steps 182 and 184 of Dent's FIG. 13, and that item (2) of claim 1 (the switch that directs a waveform ...) is taught as part of step 186, and that item (3) of claim 1 (wherein the multiple beam array antenna ...) is taught as part of steps 188 and 190.

Applicant concedes that Dent broadly discloses a self-addressing feature in his steps 182 and 184. However, his step 186 is specifically limited to teaching beam steering using a phased array antenna, as is completely evident from the Dent disclosure. Similarly, his steps 188 and 190 are specifically limited to beam steering and beamforming in a phased array antenna, and contain no suggestion of a beam hopping system. The present invention lies in a combination of a self-addressed packet switching feature in combination with a beam hopping downlink architecture. Dent arguably teaches self-addressed packet switching, but only in the context of a phased

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array antenna. Claim 1 and the other independent claims have been further amended to emphasize what is believed to be the novel combination of the invention.

The Examiner's comments concerning "what may be at issue" are not believed to be pertinent to the invention as claimed. Applicant is not specifically claiming that a single uplink packet is transmitted over multiple downlink beams to multiple destinations. The Examiner's discussion of Peyrovian, and the alleged motivation for combining Peyrovian's teachings with those of Dent, are also not believed to be pertinent to the present invention as claimed. As noted above, Peyrovian has nothing to do with multiple downlink beams, whether multicast or not. It concerns only an uplink receiver architecture, and nothing in paragraph [0029] suggests anything to the contrary.

More importantly, Dent teaches a multi-signal transmit array that is embodied in an active phased array antenna. The present invention utilizes beam hopping to reach multiple "cells" or beam spots in a terrestrial region. In beam hopping, downlink signals generated by at least one transmitter are "hopped" rapidly from one beam spot to another. In the Dent disclosure, multiple downlink beams are generated simultaneously from a single phased array antenna, but with the "fan" limitations inherent in the phased array.

As to claim 2, the Examiner references Dent, column 17, lines 52-55. The cited section mentions the possibility of using separate queues for separate cell destination. Applicant concedes that this feature is not, by itself, novel. Again, Applicant stresses that novelty of the present invention lies in the combination of beam hopping and a self-addressed packet-switched communication system, as defined in claim 1. Accordingly, claim 2 should be allowable with its parent claim.

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As to claim 3, the Examiner refers to Dent, column 18, lines 1-20. The cited section discusses transmission priority based on waiting time for each packet. Claim 3 recites that the queues are based on hop location and priority. Again, claim 3 is believed to be patentable with its parent claim.

As to claims 4 and 5, the Examiner asserts that, although Dent is silent or deficient with respect to distinguishing a queue by coding rate, this feature would have been obvious to one skilled in the art prior to Applicant's invention. Applicant does not agree that Dent provides any motivation to add this claimed feature and believes, in any event, that claims 4 and 5 should be allowable with the claims from which they depend.

As to claim 17, the Examiner refers to the reasons for rejection of claim 1. Claim 17 has been further amended to emphasize that the claimed method applies to a beam hopping communication system, and is believed to be allowable for the same reasons as claim 1.

As to claim 18, the Examiner refers to Dent, column 18, line 24, for disclosure of a "destination identifier code" said to be equivalent to a queue tag. Whether the features are equivalent or not, Applicant believes that claim 18 should be allowable with claim 17, from which it depends.

As to claims 19 and 20, the Examiner refers to the reasons for rejection of claims 3 and 4. Applicant believes these claims to be allowable for the same reasons as claims 3 and 4.

As to claim 21, the Examiner refers to the reasons for rejection of claim 13. This rejection does not seem to fall within the rejection of claims 1-5 and 7-22 in this section of the action, and will be discussed below. Similarly, claim 22 appears to belong only

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with the ground of rejection discussed in section 8 of the action and will be discussed below.

In section 7 of the action, claims 7 and 8 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Dent in view of Peyrovian and Hannan (US 3,864,679). Claims 7 and 8 define the structure of the multiple beam antenna more specifically. Since neither Dent nor Peyrovian discloses this structure, the Examiner cites Hannan for this purpose. Hannan discloses a multiple beam antenna. The Examiner asserts that "one skilled in the art would have been motivated to use feedhorns to help radiate the signal." Applicant respectfully disagrees. There is no motivation to use the Hannan multiple beam antenna with the Dent structure, unless one is attempting to construct the system of the present invention, using Applicant's specification as a guide. Moreover, claim 7 and 8 should be patentable with the parent claim from which they depend.

In section 8 of the action, claim 22 was rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Dent in view of Peyrovian in further view of Silinsky (US 5,617,108). Silinsky is relied on only for its disclosure of a ferrite switch. Applicant, of course, acknowledges that ferrite switches are known in the art, but submits that claim 22 should be allowable with claim 17, from which it depends.

In section 9 of the action, claims 1, 2, 9, 13-15, 17, 18 and 21 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hsu et al. (US 5,875,181) in view of "A Satellite-Switched CDMA System for Fixed Service Communications," by Gerakoulis et al. The Examiner contends that Hsu teaches the claimed invention except for the color control signal feature. Hsu discloses a satellite communication system in which the uplinks are encoded using CDMA and the downlinks that are said to employ

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time division multiplexing (TDM). However, the downlink function, other than being described as using TDM (to multiplex multiple messages in one beam), is not described at all. There is no disclosure of beam hopping downlinks, but only a description of one (and impliedly more) TDM downlink beams, presumably directed on a continuous basis to beam spots on the earth. Therefore, although the Hsu system may disclose self-addressed switching at the satellite, there is no disclosure or suggestion of a beam hopping architecture for the downlinks, and in fact no suggestion of any particular type of downlink architecture, other than saying that each beam uses TDM. Thus, adding some form of color control to the signals still does not result in the present invention as defined in independent claims 1, 9, and 17 which are, therefore, believed to be allowable over Hsu and Gerakoulis.

The Examiner's specific references to Hsu in rejecting the dependent claims do not overcome the major deficiency of Hsu discussed above. Therefore, these rejections based in part on Hsu are believed to be without proper basis.

In section 10 of the action, claims 3-5, 11-12, 16 and 19-20 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hsu in view of Gerakoulis and in further view of Gilderson ("Onboard Switching for ATM via Satellite"). The latter reference is relied on to show a teaching of buffering to support quality of service (QoS) in support of an ATM switch. Although Gilderson describes queuing mechanisms for use in an ATM switched satellite communication system, it does not cure the above-noted deficiencies of Hsu itself as a valid reference. Applicant submits that all of these dependent claims should be allowable with the claims from which they depend.



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In section 11 of the action, claims 7, 8 and 10 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hsu in view of Gerakoulis and further in view of Hannan. The latter reference is relied on, as before, for its teaching of a multiple antenna array. However, there is no motivation to use the Hannan multiple beam antenna with the Hsu structure, unless one is attempting to construct the system of the present invention, using Applicant's specification as a guide. Combining Hannan with Hsu arguably provides a system of the Hsu type with a more well defined downlink architecture, but there is nothing in either reference, or in Gerakoulis, suggesting that the downlink architecture should use beam hopping. Accordingly, this ground of rejection is also believed to be without a proper basis.

Finally, in section 12 of the action claim 22 was rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hsu in view of Gerakoulis and further in view of Silinsky. As acknowledged above, ferrite switches are admittedly known in the art. However, claim 22 is believed to be allowable with claim 17, from which it depends.

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In view of the foregoing, withdrawal of the rejections and allowance of the application are respectfully requested.

Respectfully submitted,

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Noel F. Heale  
Registration No. 26,074

Northrop Grumman Space Technology  
One Space Park, E1/2041  
Redondo Beach, CA 90278  
Telephone: (310) 812-4910  
FAX: (310) 812-2687